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CLINICAL CHARACTERISTICS OF DYSPEPSIA SYNDROME IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Abstract
To estimate the prevalence of dyspepsia and to study its clinical manifestations and risk factors in patients with type 2 diabetes mellitus. One hundred and seven patients with type 2 DM and 33 with functional dyspepsia were examined. A clinical and laboratory study and testing were made to identify the symptoms of dyspepsia; dyspepsia-associated factors were studied. Dyspepsia was observed in 71.0 % of the examined patients with type 2 DM. It may be attributed to organic gastrointestinal tract (GIT) diseases only in 42.3% of cases. In the type 2 DM patients, dyspepsia that could not be explained by organic GIT diseases was mainly manifested by a dyskinetic type while an ulcer-like type was prevalent in those with organic GIT diseases. In the patients with type 2 DM, dyspepsia that could not be accounted for GIT diseases was associated with the duration of carbohydrate metabolism disturbance, the presence of diabetic complications, Helicobacter pylori infection, and patient age. Some symptoms of dyspepsia (repletion and epigastric discomfort), which could not be explained by organic GIT diseases in patients with type 2 DM were associated with diabetic complications and carbohydrate metabolic parameters. Dyspepsia in type 2 DM was observed in 71% of cases; it can be due to organic GIT diseases in 42.3% and its association with digestive organ pathology was not revealed in 57.7%.

Keywords: confidence interval, gastrointestinal tract, coronary heart disease, body mass index, odds ratio, diabetes mellitus, glomerular filtration rate, mucous membrane.

Introduction

Diabetes mellitus (DM) is a group of metabolic diseases characterized by high rates of morbidity [1, 2] and systemic complications involving various organs and systems, including the gastrointestinal tract [1-3]. Symptoms of dyspepsia are among the most common complaints related to digestive disorders and occur in 25% of the population [4, 5]. The concept of dyspepsia has been repeatedly revised and clarified. According to the Roman Criteria II (1999), dyspepsia is understood as a feeling of pain or discomfort, early satiety, overflow localized in the epigastric region, as well as bloating or nausea [6]. Based on the assessment of the leading clinical manifestation, dyskinetic and ulcerative-like variants of dyspepsia syndrome are distinguished [6-8]. In the dyskinetic variant, symptoms of discomfort, early satiety, feelings of overflow, swelling in the epigastric region and nausea prevail, with ulcerative-like pain in the epigastric region. A number of studies have shown that symptoms of dyspepsia are observed in patients with type 2 diabetes more often than in patients without impaired carbohydrate metabolism [9]. The results of studies of dyspepsia syndrome in patients depending on the compensation of carbohydrate metabolism [9, 10], as well as infection with Helicobacter pylori are contradictory [11, 12].

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The Purpose of the Study

To study the prevalence, clinical manifestations of dyspepsia syndrome and factors associated with its occurrence in patients with type 2 diabetes.

Materials and Methods

A single-center, single-stage observational descriptive comparative study was conducted. The stages of the work were carried out with the voluntary consent of the patients. 212 patients with type 2 diabetes were included in the study using a continuous sampling method. After a thorough examination, taking into account the inclusion and exclusion criteria, there was

A group of patients has been formed for further research. Inclusion criteria: Type 2 diabetes. Exclusion criteria: conditions and diseases in the stages requiring urgent intervention, impaired cognitive function, the use of drugs from the group of nonsteroidal anti-inflammatory drugs, antibiotics, theophylline, cardiac glycosides, potassium and iron preparations that can provoke symptoms of dyspepsia during the last 12 months. The formed group consisted of 107 patients with type 2 diabetes (38.3% of women, 61.7% of men) aged 54.2±10.1 years. The duration of type 2 diabetes was from 0 to 20 years (on average 6.9±5.81 years). Compensation of carbohydrate metabolism by the level of glycated hemoglobin (HbA1c) averaged 7.3±1.21%. Treatment of hyperglycemia included oral hypoglycemic drugs, insulin therapy or combination treatment. None of the patients included in the study associated the presence of dyspepsia syndrome with the prescribed treatment. There were no differences in the frequency of drug administration in the groups, depending on the presence or absence of dyspepsia. The diagnosis of type 2 diabetes was confirmed by assessing the glycemic profile and HbA1c level [1, 2]. The WHO classification (1999) was used to formulate the diagnosis of type 2 diabetes. All patients were clinically examined in detail with an assessment of complaints, anamnesis, objective research with the study of laboratory parameters of carbohydrate metabolism, clinical and biochemical screening of complications of diabetes. All patients underwent endoscopic examination of the mucous membrane (CO) of the upper gastrointestinal tract with histological detection of Helicobacter pylori in the stomach. A detailed examination revealed dyspepsia syndrome according to Roman criteria II [6] in 76 patients. Of these, 32 patients (average age 56±8.65 years, 27.3% of women, 72.7% of men) had organic gastrointestinal diseases that could cause this syndrome. In 44 patients (57.7±9.81 years, 45.5% of women, 54.5% of men), dyspepsia syndrome could not be explained by the organic pathology of the gastrointestinal tract. There were no complaints of dyspepsia symptoms in 31 patients with type 2 diabetes (49.3±8.22 years, 54.8% of men, 45.2% of women). A group of patients with functional dyspepsia was also formed by the continuous sampling method for comparative studies (n=33; 41.2±10.61 years, 16.1% of women, 83.9% of men). Statistical data processing was carried out using SPSS 11.5 software packages. For quantitative data, the mean value (M) and standard deviation (SD) were calculated, the results are presented as M±SD. For paired intergroup comparison of indicators, the Mann-Whitney U—criterion was used, and the Pearson correlation coefficient was used to determine the relationship between the studied features. The odds ratio (OR) with 95% confidence intervals (95% CI) was calculated using conjugacy tables. The critical level of significance when testing statistical hypotheses (p) was assumed to be less than 0.05.

Results and Discussion

Dyspepsia syndrome was detected in 76 (71%) of 107 patients with type 2 diabetes included in the study. According to other studies, the incidence of dyspepsia symptoms in patients with type 2 diabetes was higher than in the general population [9, 10, 13], and reached 18.2-68%, depending on the criteria of dyspepsia syndrome and the clinical characteristics of the examined type 2 diabetes patients. In contrast to patients with type 2 diabetes without dyspepsia syndrome, patients with type 2 diabetes with dyspepsia syndrome had a 2-fold longer duration of diabetes due to individuals who were observed for 5 years or more (8.7±6.3 and 4.3±3.7 years, respectively; p=0.001). Patients with dyspepsia had higher HbA1c levels (7.5±1.3 and 7±0.79%; p=0.03) and lower glomerular filtration rate (GFR) (100.3±24.83 and 113.2±15.71 ml/min; p=0.013). In the type 2 diabetes group with dyspepsia, diabetic retinopathy was 2.6 times more common, diabetic neuropathy was 2 times more common, coronary heart disease - CHD was 3.9 times more common (p<0.006), H. pylori infection was 2.1 times higher (58 and 27%; p=0.007). Thus, dyspepsia syndrome was more often detected in patients with type 2 diabetes with a longer duration of the disease, worse glycemic parameters, against which complications of diabetes (retinopathy, neuropathy, CHD) are formed, in patients with H. pylori infection. Of 76 patients with type 2 diabetes with dyspepsia, 42.1% had organic gastrointestinal diseases that can explain the presence of dyspepsia syndrome: 34.4% of patients had pathology of the biliary tract, 25% had gastric or duodenal ulcer, 21.9% had gastroesophageal reflux disease, 18.7% had gastric and/or duodenal erosion guts. In the remaining 57.9%, the manifestations of dyspepsia could not be explained by concomitant gastrointestinal diseases.

As can be seen in the figure, in patients with type 2 diabetes with dyspepsia syndrome, which cannot be explained by the organic pathology of the gastrointestinal tract, the dyskinetic variant prevailed, which corresponds to the data of other researchers [10, 13]. A feeling of overflow was observed in 70% of the surveyed, and discomfort in the epigastrium in 61%. In patients with type 2 diabetes with dyspepsia and organic pathology of the gastrointestinal tract, which causes the symptoms of dyspepsia, as in patients with functional dyspepsia, an ulcer-like variant of dyspepsia with a predominance of epigastric pain prevailed, which was observed in 59 and 73% of cases, respectively.The frequency of detection of early saturation and overflow in patients with type 2 diabetes with dyspepsia, which cannot be explained by organic gastrointestinal diseases, was significantly higher (p<0.004) than in other groups. Patients with type 2 diabetes with dyspepsia syndrome due to organic gastrointestinal pathology, compared with patients with dyspepsia, which cannot be explained by concomitant gastrointestinal diseases, had similar clinical (duration of diabetes, body mass index — BMI, complications of diabetes), anthropometric indicators (gender and age), H. pylori infection rate and laboratory parameters. Attention was drawn to the presence of decompensated carbohydrate metabolism (HbA1c levels of 7.07±1.09 and 7.5±1.3%; p=0.019) and hypercholesterolemia (5.6±0.96 and 5.8±1.00 mmol/l; p=0.72) in both groups. Compared with patients with functional dyspepsia, patients with type 2 diabetes with dyspepsia were older (57.0±9.84 and 41.2±10.61 years; p=0.001), had a higher BMI (29.8±3.30 and 25.6±1.60 kg/m2; p=0.001), they were more likely to have coronary heart disease (75 and 18.0%; p=0.005), lipid metabolism disorders were more often recorded (total cholesterol levels 5.8±1.00 and 5.4±1.04 mmol/l; p=0.04), renal GFR was lower (100.3±24.82 and 118.5±15.71 ml/min; p=0.0001).

A comparison of the selected groups allowed us to conclude that dyspepsia syndrome has different manifestations depending on clinical characteristics (patients with type 2 diabetes with the presence or absence of concomitant gastrointestinal diseases, patients with functional dyspepsia). To identify the factors associated with dyspepsia syndrome, clinical features (BMI, duration of the

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disease, presence of complications of diabetes - diabetic retinopathy, diabetic neuropathy, nephropathy, non—alcoholic fatty liver disease, coronary heart disease), anthropometric indicators (gender and age), laboratory parameters were analyzed in patients with type 2 diabetes without organic gastrointestinal pathology (total blood glucose, fasting blood glucose, HbA1c concentration, total cholesterol, alanine and aspartic aminotransferases, creatinine, GFR), H. pylori infection. According to the presented data, associations of dyspepsia syndrome with the duration of type 2 diabetes, the presence of complications such as diabetic retinopathy and neuropathy, coronary heart disease were revealed. Consequently, dyspepsia syndrome is formed along with other complications of diabetes. The above allows us to consider dyspepsia syndrome as one of the complications of type 2 diabetes. Dyspepsia syndrome was also associated with the presence of H. pylori infection and the age of patients. Decompensation of carbohydrate metabolism in patients with type 2 diabetes contributes to the formation of various complications of diabetes [1, 2], including dyspepsia syndrome. In addition to dyspepsia syndrome in general, some of its symptoms were also associated with some characteristics of the underlying disease. In the table. 2 it was shown that the symptom of overflow in the epigastrium was associated with the presence of diabetic retinopathy and neuropathy, coronary heart disease, with HbA1c levels, and fasting blood glucose levels. The symptom of discomfort was associated with the duration of type 2 diabetes, the presence of diabetic neuro- and retinopathy, coronary heart disease, H. pylori infection, fasting blood glucose, basal glycemia and HbA1c. The symptom of nausea was associated with the presence of diabetic retinopathy. These results allow us to consider dyspepsia syndrome in patients with type 2 diabetes as a consequence of hyperglycemic syndrome and confirm the point of view that dyspepsia syndrome should be considered as one of the gastroenterological complications of type 2 diabetes, and the disease itself as a multiple organ pathology.

Conclusion

Dyspepsia syndrome in type 2 diabetes is observed in 71% of cases; in 42.3% it can be explained by organic diseases of the gastrointestinal tract, and in 57.7% there was no connection with the pathology of the digestive organs. Dyspepsia syndrome in patients with type 2 diabetes, which cannot be explained by organic gastrointestinal diseases, is manifested mainly by the dyskinetic variant, while in patients with type 2 diabetes with organic gastrointestinal diseases and in patients with functional dyspepsia, the ulcer-like variant prevails. Dyspepsia syndrome in patients with type 2 diabetes, which cannot be explained by gastrointestinal diseases, is associated with the duration of carbohydrate metabolism disorders, the presence of diabetic retinopathy and neuropathy, coronary heart disease, H. pylori infection and the age of patients. Some manifestations of dyspepsia syndrome (a symptom of overflow and discomfort in the epigastrium), which cannot be explained in patients with type 2 diabetes with organic gastrointestinal diseases, are also associated with indicators of carbohydrate metabolism: a symptom of overflow - with the level of glycated hemoglobin HbA1c and fasting blood glucose, a symptom of discomfort — with the level of glycated hemoglobin HbA1c, with a basal level blood glucose and fasting blood glucose levels.

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